

(12) UK Patent Application (19) GB (11) 2 323 554 (13) A

(43) Date of A Publication 30.09.1998

(21) Application No 9706397.8

(22) Date of Filing 27.03.1997

(71) Applicant(s)

Rover Group Limited  
(Incorporated in the United Kingdom)  
International Headquarters,  
Warwick Technology Park, WARWICK, CV34 6RG,  
United Kingdom

(72) Inventor(s)

Brian David Lidgard

(74) Agent and/or Address for Service

Alan S Wilson  
Rover Group Limited, Gaydon Test Centre,  
Banbury Road, Lighthorne, Warwick, CV35 0RG,  
United Kingdom

(51) INT CL<sup>6</sup>

B29C 45/14, B29D 7/00 9/00

(52) UK CL (Edition P)

B5A AB19 A1R214H A1R314C1F A1R400 A1R422  
A2D1X A2D2 A2E3 A2K2 A2L A2OT14

(56) Documents Cited

GB 2209495 A US 4369157 A

(58) Field of Search

UK CL (Edition O) B5A AA1 AB1 AB19 AC AT14M  
INT CL<sup>6</sup> B29C 45/14, B29D 7/00 9/00  
Online:WPI

(54) Abstract Title

**A plastics moulded component for a vehicle and a method of manufacturing the component**

(57) A plastics moulded component 48 for a vehicle is disclosed comprising a plastics substrate layer 36 joined to a colour coat layer 16 by an adhesive layer 18 wherein the colour coat layer comprises a hologram 20. The invention also discloses a method of manufacturing such a component 48, (78)(figure 9-not shown) both as a shallow draw and as a deep draw moulding. The hologram 20, 62 is a visible decorative feature, such as the vehicle trade mark, and the component may comprise, for example, a dash panel of the vehicle.

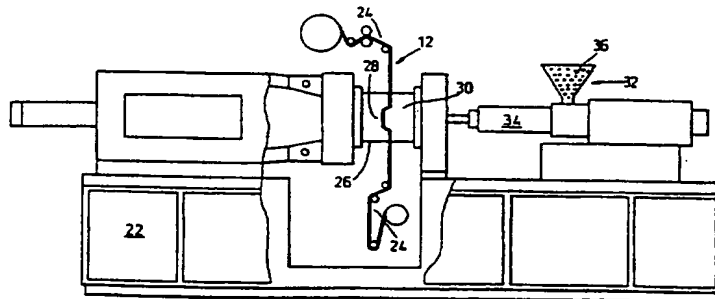


Fig. 2

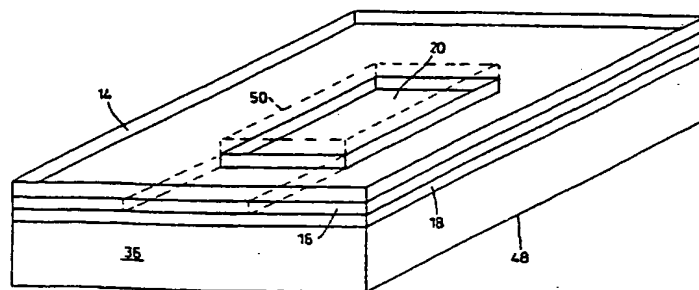
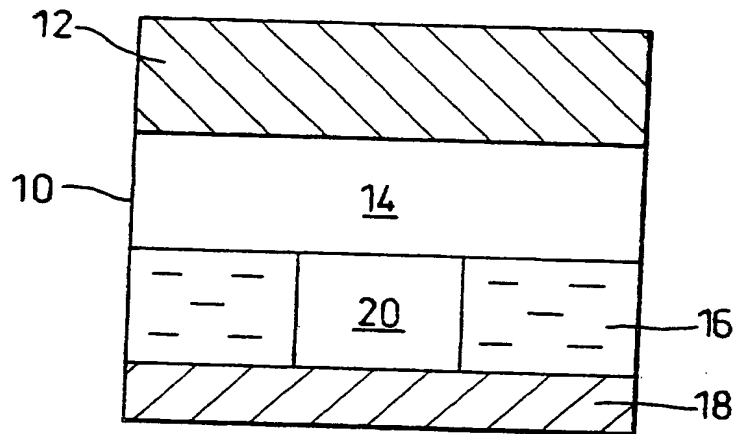
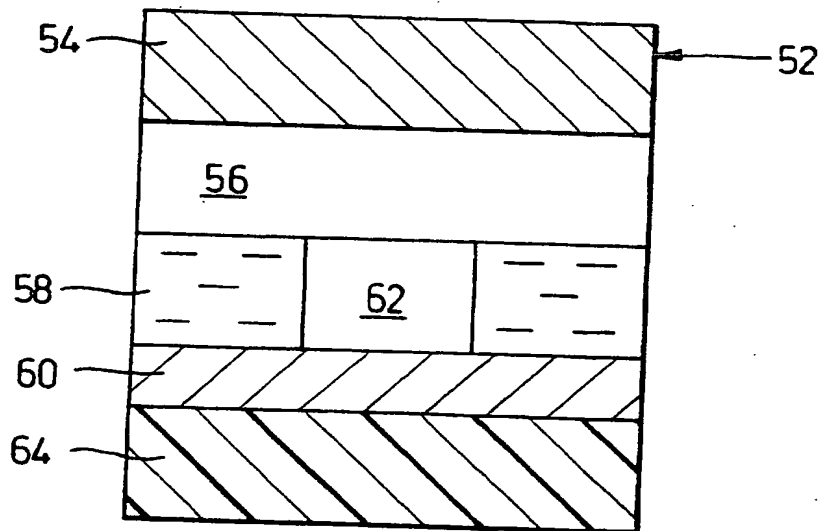


Fig. 4

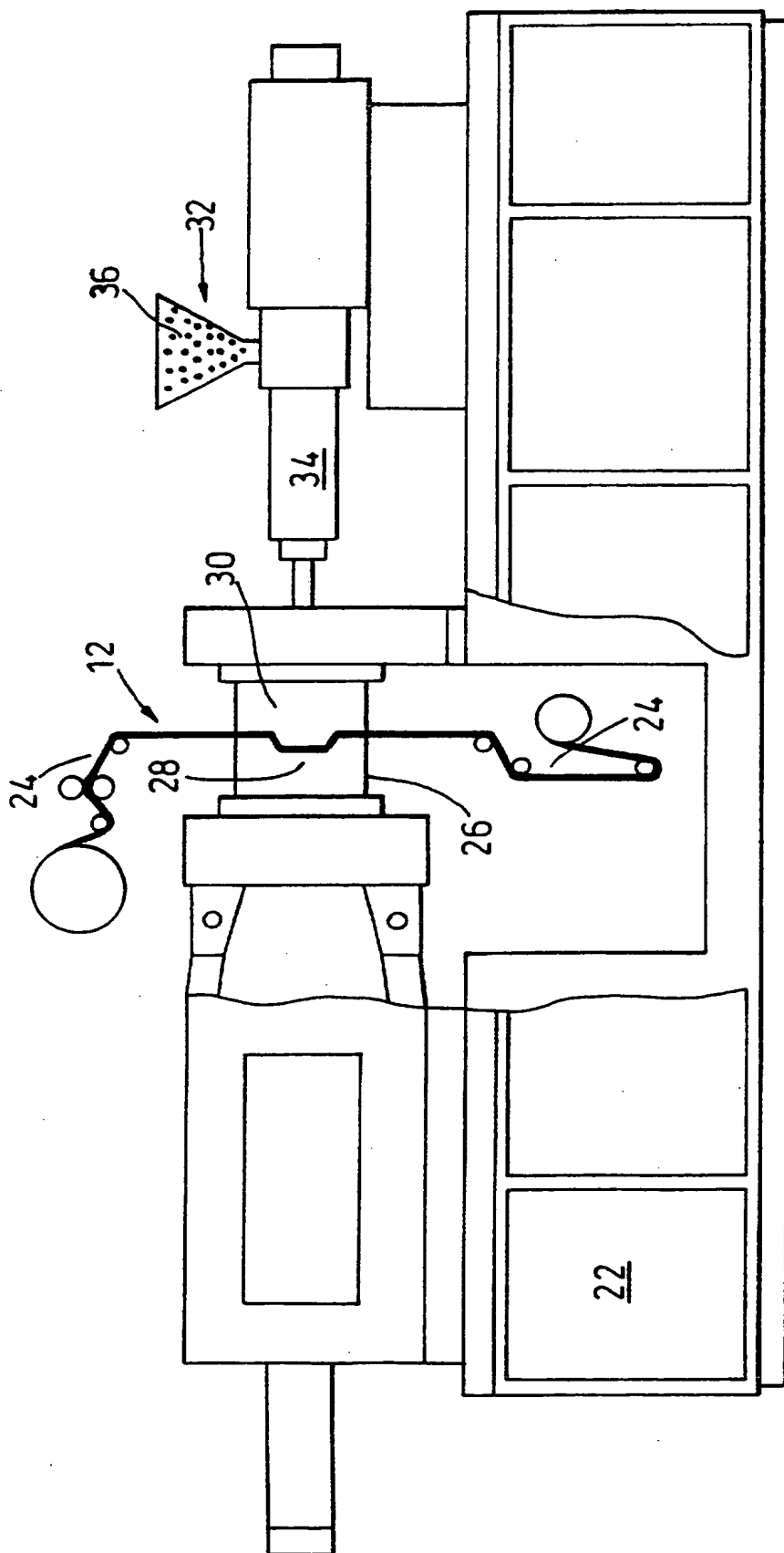
1/6



***Fig. 1***

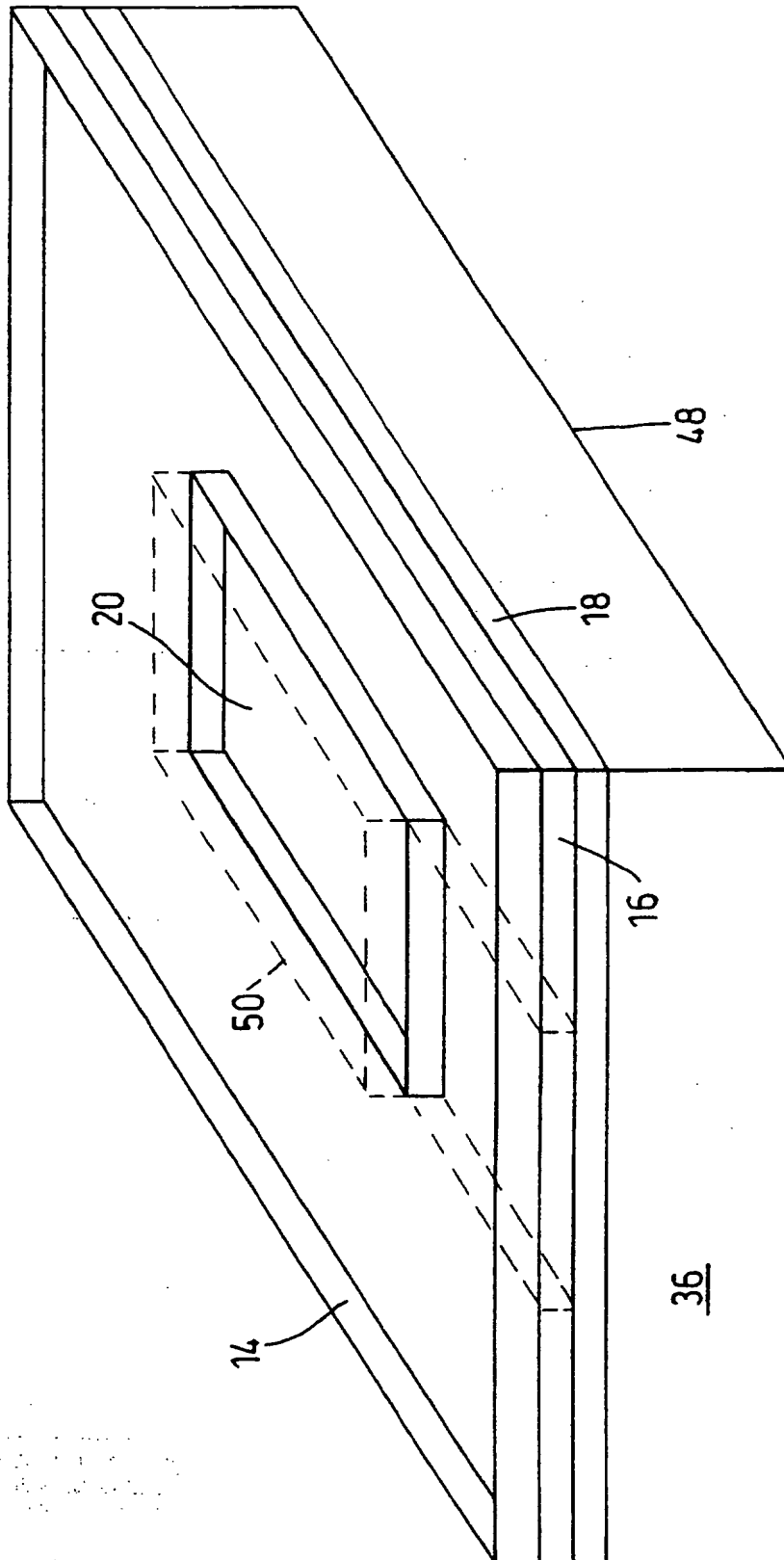


***Fig. 5***



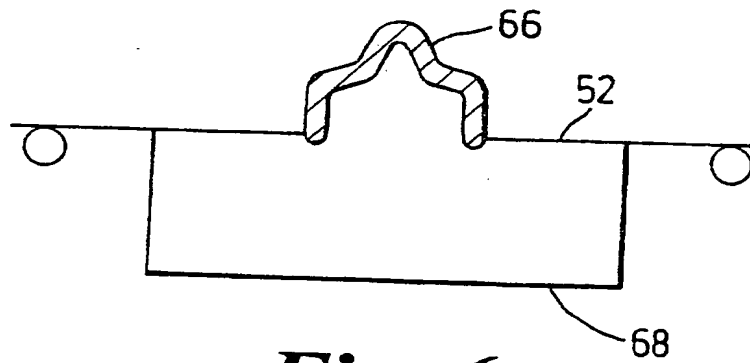
*Fig. 2*



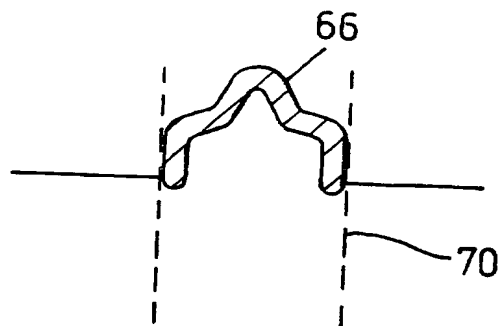


**Fig. 4**

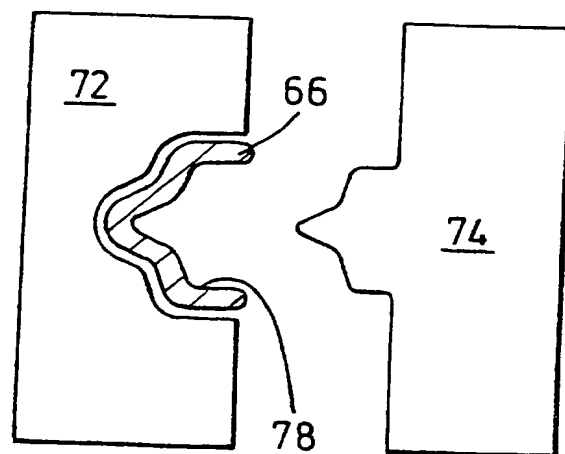
5/6



**Fig. 6**



**Fig. 7**



**Fig. 8**

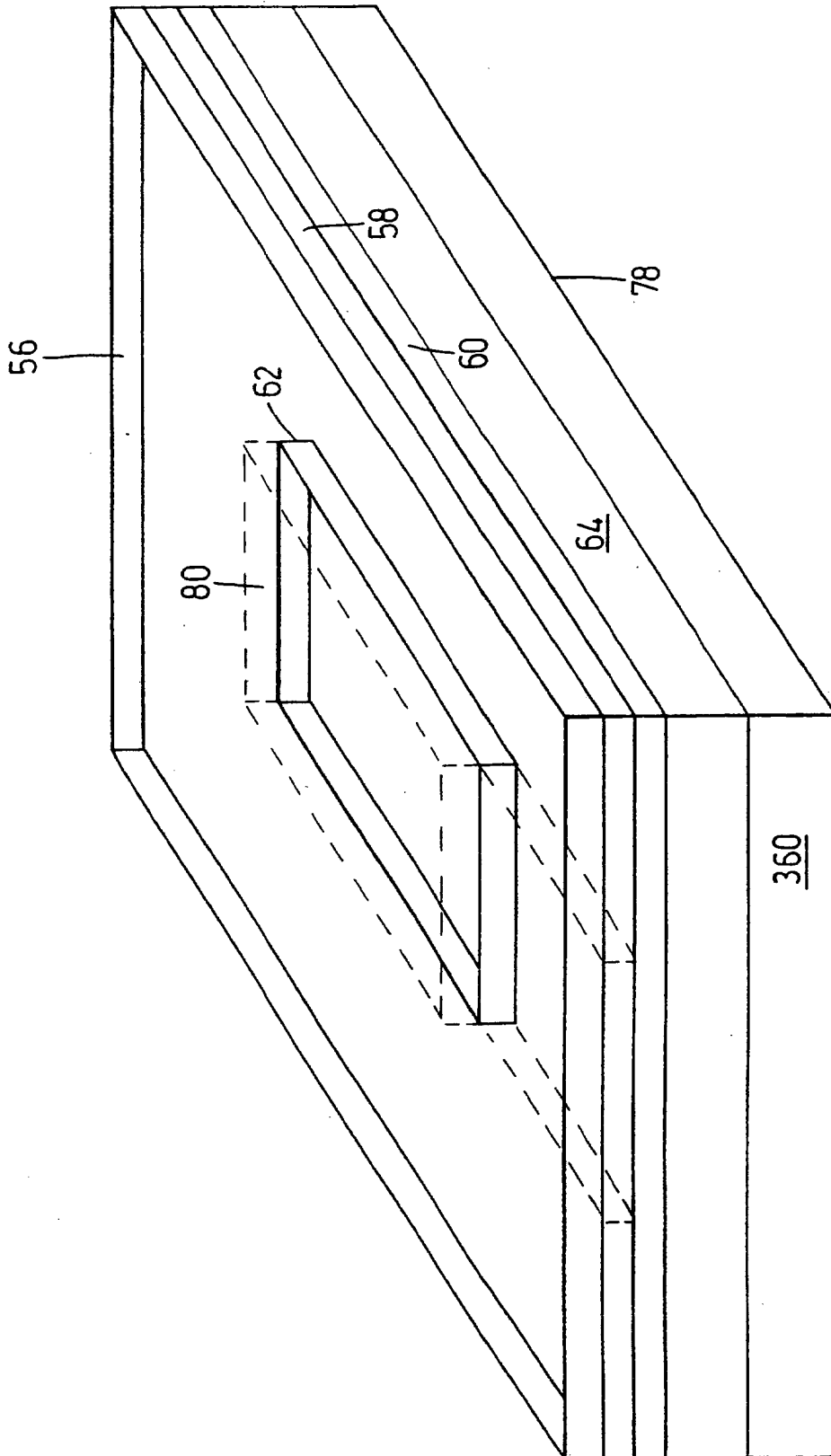


Fig. 9

A Plastics Moulded Component for a Vehicle and a Method of  
Manufacturing such a Component

This invention relates to plastics moulded components for vehicles and to a method of manufacturing such components and in particular to such a component having a hologram forming part thereof.

It is known to provide a plastics moulded component for a vehicle which  
5 has a decorative feature. It is also known to provide such a decorative feature by joining a moulding foil to a plastics substrate layer.

It is an object of this invention to provide an improved plastics moulded component for a vehicle having a hologram forming part of the component and to provide a method of manufacturing such a component.

10 According to the invention there is provided a plastics moulded component for a vehicle comprising a plastics substrate layer and a colour coat layer, the substrate layer being joined to the colour coat layer, wherein the colour coat layer comprises a hologram.

The component may further comprise an adhesive layer joining the  
15 hologram to the substrate layer and may also further comprise a substantially transparent clear coat layer over the hologram.



The component may comprise an item of trim of the vehicle and the hologram may comprise a decorative feature of the component. The component may comprise the dash panel, and the hologram may be a visible decorative feature of the dash panel and may comprise a hologram of the  
5 trade mark of the vehicle or the manufacturer.

The invention also provides a method of manufacturing a plastics moulded component for a vehicle comprising the steps of:

- a) positioning a moulding foil having a colour coat layer comprising a hologram into a moulding apparatus;
- 10 b) introducing a substrate plastics material into the moulding apparatus; and
- c) joining the hologram to the substrate plastics material by moulding.

The moulding foil may further comprise an adhesive layer between the  
15 hologram and the substrate layer and the hologram may be joined to the substrate layer by an adhesive bond. The moulding foil may also comprise a substantially transparent clear coat layer over the hologram and a further

layer joined to the adhesive layer and the moulding foil may be joined to the substrate material by moulding the further layer to the substrate material.

The moulding foil may further comprise a carrier foil to support the colour coat layer and the carrier foil may be removed during the moulding  
5 process.

The invention also provides a vehicle including a plastics moulded component according to the invention.

The invention will now be described by way of example with reference to the accompanying drawings in which:

10 Figure 1 is a section through a moulding foil according to a first embodiment of the invention;

Figure 2 is a diagrammatic representation of a moulding apparatus according the first embodiment;

Figure 3 is a section through part of the apparatus of Figure 2;

15 Figure 4 is an isometric view of a component according to the first embodiment;

Figure 5 is a section through a moulding foil according to a second embodiment of the invention;

Figure 6 shows part of an apparatus of the second embodiment used to pre-form the moulding foil of Figure 5;

5      Figure 7 is a mould shell produced using the apparatus of Figure 6;

Figure 8 is a section through part of a moulding apparatus according to a second embodiment of the invention; and

Figure 9 is an isometric view of a component according to the second embodiment.

10      Referring to Figure 1, in a first embodiment of this invention a moulding foil segment 10 is held on a section of a continuous carrier foil 12 and comprises a transparent clear coat layer 14, a colour coat layer 16 and an adhesive layer 18. The colour coat layer 16 has a hologram 20 contained within it.

15      Referring now also to Figure 2, the carrier foil 12 is fed through a moulding apparatus 22 by a series of rollers 24.

The moulding apparatus 22 comprises a moving mould platen in the form of a cavity tool 26 defining a cavity 28 and a stationary mould platen in the form of a forming tool 30.

A plastics injection means in the form of a resin hopper 32 and a resin  
5 feed 34 is connected to the forming tool 30 to supply a substrate moulding material 36, such as ABS, from the hopper 32.

Now referring also to Figure 3, the cavity tool 26 comprises a cavity surface 38 which defines the cavity 28 and through which is provided a vacuum exhaustor 40. The forming tool 30 has a forming face 42 to co-  
10 operate with the cavity surface 38 when the moulding foil segment 10 is interposed between them. The forming tool 30 has an injection nozzle 44 running through it from the feed 34 to the forming face 42. An injection cavity 46 exists between the forming tool 30 and the moulding foil 10.

The moulding apparatus 22 is opened by moving the cavity tool 26 and  
15 the rollers 24 away from the forming tool 30, which remains stationary. The carrier foil 12 is indexed past the cavity 28 by one moulding foil segment 10 each time the cavity tool 26 and forming tool 30 are opened. The carrier foil 12 faces the cavity surface 38 and the adhesive layer 18 faces the forming tool 30. When a moulding foil segment 10 has been

positioned across the cavity 28, it is drawn against the cavity surface 38 by evacuation of the cavity 28 by the vacuum exhauster 40.

The moulding apparatus 22 is then closed by moving the cavity tool 26 and the rollers 24 towards the forming tool 30, until only an injection cavity 46 remains between the forming face 42 and the moulding foil segment 10.

The substrate moulding material 36 is injected into the injection cavity 46 by the nozzle 44, which is fed from the resin hopper 32 through the resin feed 34. The substrate moulding material 36 is joined to the moulding foil segment 10 by an adhesive bond between the adhesive layer 18 and the substrate moulding material 36. The substrate 36 and the moulding foil segment 10 form a component 48 as shown in Figure 4.

The moulding apparatus 22 is then opened and the segment 10 separates from the carrier foil 12 and remains on the forming tool 30 with the component 48 of which it is now part. The hologram 20 is visible through an area 50 of the clear coat layer 14.

The component 48 is removed from the forming tool 30 by a robotic arm (not shown) and the carrier foil 12 is indexed forward to bring the next moulding foil segment 10 into position over the cavity 28. The cycle is then repeated to produce further components.

The first embodiment is most suitable for the production of components 48 with a shallow draw. To reduce the likelihood of wrinkling of the moulding foil during the manufacture of deep draw components, the second embodiment of this invention is preferred, as described below with reference 5 to the remaining figures.

Referring to Figure 5, a modified moulding foil segment 52 comprises a carrier foil 54, a transparent clear coat layer 56, a colour coat layer 58 and an adhesive layer 60, all of which are similar to the equivalent layers 10, 12, 14, 16, 18 of the first embodiment. The colour coat layer 56 has a hologram 10 62 contained within it. An additional layer is provided on the moulding foil segment 52 below the adhesive layer 60 in the form of a plastics layer 64 made of ABS.

Referring also to Figure 6, the moulding foil 52 is pre-formed into a series of deep draw shells 66 (only one shown) in a vacuum forming machine 15 68. The carrier foil 54 is removed from the clear coat layer 56 during the pre-forming process.

Referring also to Figure 7, the moulding foil 52 is removed from the vacuum forming machine 68 and trimmed around the periphery 70 of each shell 66 to produce a series of deep draw shells 66. The shells 66 are then 20 cleaned to remove dust using a de-ionising gun (not shown).

Referring also to Figure 8, a robotic feed (not shown) places the shells 66 into a cavity tool 72 with the clear coat layer 56 facing the cavity tool 72 and the plastics layer 64 facing a forming tool 74.

The cavity tool 72 and the forming tool 74 are then closed in similar  
5 fashion to the process of the first embodiment. A substrate moulding material 360 made of ABS is injected behind the plastics layer 64. As the plastics layer 64 is compatible with the substrate material 360, both being ABS, the moulding foil 52 and the substrate material 360 are joined by moulding to form a component 78. The tools 72, 74 are then opened and the  
10 component 78 is removed by the robotic feed.

Referring also to Figure 9, the carrier foil 54 is removed and the clear coat layer 56 is exposed. The hologram 62 forms part of the colour coat layer 58 and is visible through an area 80 in the clear coat layer 56.

The component 48, 78 comprises a trim panel, in the form of a dash  
15 panel, for a vehicle (not shown further) and the hologram 20 is a decorative feature of the dash panel and comprises the trade mark of the vehicle brand.

CLAIMS

1. A plastics moulded component for a vehicle comprising a plastics substrate layer and a colour coat layer, the substrate layer being joined to the colour coat layer, wherein the colour coat layer comprises a hologram.
2. A plastics moulded component for a vehicle according to Claim 1 further comprising an adhesive layer joining the hologram to the substrate layer.
3. A component according to Claim 1 or Claim 2 further comprising a substantially transparent clear coat layer over the hologram.
4. A component according to any one of Claims 1 to 3 wherein the component comprises an item of trim of the vehicle.
5. A component according to any preceding Claim wherein the hologram comprises a decorative feature of the component.
6. A method of manufacturing a plastics moulded component for a vehicle comprising the steps of:
  - a) positioning a moulding foil having a colour coat layer comprising a hologram into a moulding apparatus;



b) introducing a substrate plastics material into the moulding apparatus; and

c) joining the hologram to the substrate plastics material by moulding.

7. A method according to Claim 6 wherein the moulding foil further comprises an adhesive layer between the hologram and the substrate layer and the hologram is joined to the substrate layer by an adhesive bond.

8. A method according to Claim 6 or Claim 7 wherein the moulding foil further comprises a substantially transparent clear coat layer over the hologram.

9. A method according to Claim 7 or Claim 8 wherein the moulding foil further comprises a further layer joined to the adhesive layer and the moulding foil is joined to the substrate material by moulding the further layer to the substrate material.

10. A method according to any one of Claims 6 to 9 wherein the moulding foil further comprises a carrier foil to support the colour coat layer and the carrier foil is removed during the moulding process.

11. A method of producing a plastics moulded component for a vehicle substantially as described herein with reference to the accompanying drawings.
12. A plastics moulded component for a vehicle substantially as described herein with reference to the accompanying drawings.
13. A vehicle including a plastics moulded component according to any preceding claim.



Application No: GB 9706397.8  
Claims searched: 1-13

Examiner: Monty Siddique  
Date of search: 19 May 1997

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK Cl (Ed.O): B5A (AA1, AB1, AB19, AC, AT14M)  
Int Cl (Ed.6): B29C 45/14; B29D 7/00 9/00  
Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage		Relevant to claims
X or Y	GB 2209495 A	(THE STANDARD...) layer 22 is tinted and joined to member 24 by injection moulding and displays three dimensional images	1,6 at least
Y	US 4369157	(DRI-PRINT) columns 3,4; figures 3-6 etc; moulded articles with colour coatings	1,6 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.